General Specification for Taping Surface Mounted Components

DOCUMENT IDENTIFIER: A-SP-ELMF531-00-0000 Rev B, 31-Aug-1992

ABSTRACT: This document contains information for taping surface mounted components for automatic placement. The information contained herein shall be used in addition to the requirements specified in EIA-481, Standard for Taping of Surface Mounted Components for Automatic Placement.

APPLICABILITY: This specification applies to the manufacture of all surface mount components.

STATUS: APPROVED 31-Aug-1992; use VTX SMC for current status.

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Use $ VTX ELF for the latest location information.

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CONTENTS

1 SCOPE 1

2 APPLICABLE DOCUMENTS 1
2.1 DOCUMENTS 1
2.2 CONFLICTING REQUIREMENTS 1

3 REQUIREMENTS 2
3.1 CARRIER TAPES AND COVER TAPES 2
3.2 ENVIRONMENTAL 2

4 MATERIALS USED FOR TAPES AND REELS 3
4.1 CARRIER TAPES 3
4.2 COVER TAPES 3
4.3 REELS 3
4.4 UNSPECIFIED MATERIAL 3
4.5 ELECTROSTATIC PROTECTIVE PROPERTIES 4

5 MARKING 4

6 QUALITY ASSURANCE PROVISIONS 4

Appendix A REFERENCED DOCUMENTS 5

A.1 EL-Class Digital Documents 5

A.2 Other Documents 5

A.3 Ordering Information 5

1 SCOPE

This specification defines the general requirements necessary to ensure that surface mounted components supplied on carrier tapes can be automatically picked, placed, and soldered. The following features are covered.

- Dimensions and tolerances of carrier and cover tapes
- Dimensions of reels on which the tapes are supplied
- Alternate materials used to fabricate tapes and reels
- Environmental requirements
- Marking requirements
- Quality assurance provisions

2 APPLICABLE DOCUMENTS

2.1 DOCUMENTS

The following documents, at the revision in effect at the time of order, form a part of this specification to the extent specified herein.

Electronic Industries Association

Standard for Taping of Surface Mounted Components for Automatic Placement,

EIA-481-1
EIA-481-2
EIA-481-3

American Society for Testing and Materials

ASTM-D-257, *DC Resistance or Conductance of Insulating Materials*.

2.2 CONFLICTING REQUIREMENTS

In the event of a conflict between requirements of this specification and requirements of other procurement documents, the following order of precedence shall apply.

1. The purchase order (contract)
2. The detail purchase specification
3. This document

3 REQUIREMENTS

3.1 CARRIER TAPES AND COVER TAPES

a. The dimensions and tolerances of carrier and cover tapes and reels shall comply with the latest released version of EIA-481, unless otherwise stated on the purchase order.

The following requirements shall apply to Figure 4 of EIA-481-1, -2, and -3.

NOTE

Inside surfaces of flanges shall be flat within 2 mm TIR (total indicator reading) when the reel is mounted on diameter C with either face held firmly against a shoulder less than 40 mm diameter.

The entire tape shall unreel freely, unconstricted by the flanges.

b. The following attributes shall also comply with the latest issue of EIA-481.

- Length of the leader and length of the end of the tape with no components
- Thickness and camber of the tape
- Allowable bend radius of the loaded tape
- Unreeling of the tape
- Number of missing components
- Orientation of components in the cavities

c. In addition to meeting the requirements of EIA-481, the following additional requirements shall apply to the peel strength of cover tape(s) to carrier tape(s).

- The peel strength shall meet the requirements of EIA-481 after storage for the duration and in the conditions specified under subhead 3.2 of this document.
- Samples shall be taken regularly from the process that seals the cover to the carrier tape. These samples shall be tested for peel strength. Records of these tests shall be retained and made available to Digital upon request. The results shall be traceable to lot or date codes.

3.2 ENVIRONMENTAL

After storage for a period of 12 months in a Class-3 environment, the following requirements must be met.
(Temperature: 5 - 50°C, relative humidity: 10 - 95%)

a. Reels and tapes shall meet the requirements of the applicable section of EIA-481 and the additional requirements included in this specification.

b. Components carried in the tape shall meet the requirements for solderability of the purchase specification in effect at the time of purchase.

c. Reels and flanges shall not become detached.

d. Markings and marking labels shall be legible.

e. Components in the carrier tape shall not stick to the cover tape(s).

4 MATERIALS USED FOR TAPES AND REELS

4.1 CARRIER TAPES

Type A: No specific antistatic or conductivity requirements.

Type B: Antistatic surface treatment as defined below.

Type C: Conductive. Resistivity as defined under subhead 4.5.

4.2 COVER TAPES

Type A: Transparent plastic with no specific antistatic or conductivity requirements.

Type B: Transparent plastic with antistatic surface treatment as defined under subhead 4.5

Type C: Transparent conductive plastic. Resistivity as defined under subhead 4.5

4.3 REELS

Type A: Non-dusting cardboard.

Type B: Impact-resistant thermoplastic with no specific antistatic or conductivity requirements.

Type C: Impact-resistant thermoplastic with antistatic surface treatment as defined under subhead 4.5

Type D: Conductive. Resistivity as defined under subhead 4.5

4.4 UNSPECIFIED MATERIAL

The type of material shall be specified on the detail purchase specification or on the purchase order.

If not otherwise specified, the following shall apply to passive discrete (chip) components:

- Carrier tapes: Type A
- Cover tapes: Type A
- Reels: Type B

If not otherwise specified, the following shall apply to integrated circuit components:

- Carrier tapes: Type C
- Cover tapes: Type B
- Reels: Type C

The above default conditions are minimum requirements. Suppliers may use materials of higher protective qualities.

4.5 ELECTROSTATIC PROTECTIVE PROPERTIES

ANTISTATIC: Antistatic materials shall not cause triboelectric generation of an electrostatic voltage greater than 200 volts (positive or negative).

CONDUCTIVE: Surface resistivity less than 100,000 ohms/square. Volume resistivity less than 10,000 ohms/cm.

5 MARKING

A label shall be permanently attached to the sprocket-side flange of each reel. The 'sprocket-side flange' is the flange that is facing the operator when the tape is exiting the reel at the top, feeding to the left. The following information shall be legibly and permanently printed on this label in characters of at least 4 mm (0.1 inch) high and in Code 39 bar code. Refer to *DEC STD 047-0 Bar Code Symbology* and *DEC STD 047-1 Bar Code: Product ID Carton/Container Requirements* for Digital's requirements on bar coding.

- Manufacturer's name or symbol, point of manufacture, and part number
- Date and/or lot code
- Digital part number and revision level
- Quantity of components originally supplied on the reel

An inspection stamp shall also be on the label.

6 QUALITY ASSURANCE PROVISIONS

The carrier and cover tapes and reels to be used to ship surface mount devices (SMDs) to Digital shall be submitted for approval. Changes in material or dimensions shall not be made without prior written approval from Digital.

APPENDIX A REFERENCED DOCUMENTS

A.1 EL-Class Digital Documents

EL-Class Number	Document Title
EL-00047-00	*DEC STD 047-0 Bar Code: Symbology Standard*
EL-00047-01	*DEC STD 047-1 Bar Code: Product ID and Carton Label Standard*

Use VTX SMC to order copies of EL-class documents from Standards and Methods Control. Send distribution questions to JOKUR::SMC or call DTN: 234-4423.

A.2 Other Documents

Document Number	Document Title
ASTM-D-257	*DC Resistance or Conductance of Insulating Materials*
EIA-481-1, -2, -3	*Standard for Taping of Surface Mounted Components for Automatic Placement.*

A.3 Ordering Information

Contact your local Digital Library for industry documents, or use the ordering information below.

- ASTM documents may be obtained from:
  American Society for Testing and Materials (ASTM)
  1916 Race Street
  Philadelphia, PA 19103

- Electronic Industries Association (EIA) documents may be obtained from:
  Global Engineering Documents
  A division of Information Handling Services
  1990 M Street N.W.
  Washington, D.C. 20036
  (202) 429-2860

  or

  2805 McGraw Ave.
  Irvine, CA 92714
  (714) 261-1455

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